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AUTHOR Taylcr, Robert W.; And Others
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AESTRACT

To determine the effects of grades on academic performance, 31 graduate students participated in a ccurse which, to avoid the undesirable effects of ccmpetition and ambiguity, was designed with specified course objectives and criteria for grades. The students were assigned 4 prescribed experiments that they performed in pairs. They each wrote reports on these experiments according to criteria in a "laboratory manual." The reports were graded either acceptable or unacceptable, with the latter returned to the student for revision. All students' grades were based cn overall performance, but 13 students (Grcup 2) were told that they would receive an incccmplete if all 4 experiments were not completed. The other 18 students (Grcup 1) were given a grade not contingent on ccmpletion of all experiments. Results showed that only one student frcm Group 2 failed to complete the course because cf incccmplete lab reports, while 9 students frcm Grcup I failed to complete the work. In addition, after the first paper, Group 2 had: a smaller percentage of papers requiring revision; a higher percentage of papers meeting criteria; and completed more optional experiments than Group 1. (Author/AF)

Effects of Contingent vs. Non-contingent Grading on Student Course Work [1]

Robert W. Taylor
James H. Gold
Stanley H. Lawrence

Indiana University

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ABSTRACT

Thirty-one (31) graduate students were assigned 4 prescribed experiments which they performed in pairs and individually wrote reports according to criterion set forth in a students "laboratory manual". The reports graded by the instructor were marked either acceptable (A) or unacceptable (U) with U papers returned to the student for revision.

All 31 students' grades were based on overall performance with 13 students being told they would receive an incomplete (I) if all 4 experiments were not completed while 18 students were given a grade not contingent on completion of all experiments.

Results showed that when grades are contingent upon papers meeting criteria (Group II) only one student failed to complete the course because of incomplete lab reports; while students whose grades were not contingent upon satisfactorily completing all papers (Group I) showed 9 students failing to complete the work. In addition, after the first paper, Group II had 1) a smaller percentage of papers requiring revision, 2) a higher percentage of papers meeting criteria, and 3) completed more optional experiments than Group I.

Effects of Contingent vs. Non-Contingent
Grading on Student Course Work

Marking systems (grades) serve a number of functions in our educational system. Goldsmith (1967) has divided the functions into two categories -- administrative and educational. The administrative functions might well be considered as consequences for students having attained certain grades; namely,

1) A basis for promoting students from one grade level to the next
2) Receiving credit for having taken a course
3) Obtaining certificates, diplomas, and degrees
4) A basis for receiving scholarships and honors
5) Evaluating and recommending students for employment.

Educationally, grades serve:

1) To indicate how well the student has mastered the course work
2) To establish the level of achievement that the teacher expects
3) As potential incentive.

Mannello (1964), however, suggests that grades may be dysfunctional in attaining the educational objectives desired. He indicates that student performance is being maintained by the "threat" of grades and that the competition for grades has resulted in a number of undesirable behaviors; including, cheating, and neurotic behaviors. In a frantic determin[redacted]ation to achieve high grades (or avoid failure), the student is victimized into doing virtually anything to succeed. In addition to questioning the assignment of grades based upon student-to-student comparison, Brain (1967) has asked what do grades reflect? Capacity, amount of effort, rates of learning, attitudes and behaviors in class, personality, tardiness, neatness, spelling?

By not specifying the criteria used in determining grades, a teacher may be creating an ambiguous situation for the student, thus increasing rather than decreasing the probability that the student will emit undesired behaviors; and more important, the student has no means of measuring his own progress.

As for grades "indicating how well the student is mastering his course work", they serve only as an historical commentary. In an ambiguous situation grades are non-specific in providing corrective feedback to the student. Therefore, grades are useless as a diagnostic tool for prescribing necessary remedial work for the student (Link, 1967).

In order to eliminate the undesirable effects of competition and ambiguity, a course was designed which specified course objectives and criteria for grades (Malott and Whaley, 1968).

METHOD

Subjects:

Thirty-one (31) graduate students (Ss) in the Department of Instructional Systems Technology at Indiana University were used. All were majoring in various areas of education.

Procedure:

For all Ss, the course was divided into 3 sections:

1) seminar - a programmed text dealing with the attitudes of science (parsimony, determinism, scientific manipulation, and empiricism).
2) evaluation, application, and discussion - open-ended discussion and application of behavioral principles in an educational situation

or

student interviews - students examined over text material.

The contingencies remained the same for all Ss for sections 1 and 2 but were changed in the following section:

3) laboratory - Ss were paired and performed a series of experiments: I - Shaping, extinction, and spontaneous recovery; II - Discrimination; III - Chaining of responses; and IV - Fixed ratio schedule of reinforcement. Ss were provided with a laboratory guide which described the steps required in performing the experiment, defined the behavior to be conditioned, and showed how to record the data. Following the completion of the experiment, Ss were required to write-up their experiment as described in their laboratory report style manual. This manual included the format for the paper, figures, and examples and descriptions of the type of information included under each heading (e.g. - Method, Discussion and Conclusions); acceptable abbreviations and symbols; referencing; and scientific writing style (e.g., grammatical and descriptive).

These criteria were then used by the instructor and his assistants in editing each S's paper. Corrections and editorial comments were made in the margins. If the S made correct responses (by paragraph), the editor wrote "good". When more than 10 editorial corrections were made, the paper was returned to the student for revision. The papers were returned at the next class meeting as either acceptable (A) or unacceptable (U). When more than one person was reading the papers, one paper would be read occassionally by several assistants in order to maintain editing standards (reliability).

Group 1 - Course grade non-contingent on student having all laboratory reports completed and accepted. Grades were determined on the basis of the work each student completed; i.e., each was required to complete as many of the experiments as he could during the semester (N = 18).

Group 2 - Grades contingent on students having completed all the experiments and writing an A paper. If the student did not complete all the laboratory papers, he would receive an incomplete (I) for the course. When the S completed the work, he would receive a grade of A (N = 13).

Both groups were encouraged but not required to perform an optional experiment of their own choice (i.e., human or animal).

RESULTS and DISCUSSION

The results for both groups are presented in Figure 1. The percentages of S papers having reached criteria (i.e., A) for each experiment in Group 1 show a steady decline (Exp. I - 100%; Exp. II - 89%; Exp. III - 78%; and Exp. IV - 56%). In addition, only one S performed the optional experiment.

In Group 2, only one S failed to reach criteria by not completing Exp. IV. Four (4) Ss in this group performed an optional experiment.

Figure 2 shows the percentage of papers which were submitted and unacceptable initially. The percentage of rejections for Group 2 was higher than Group 1 for Exp. I but less than Group 1 for Experiments II, III, and IV. These data would suggest that Ss in Group 1 were unable to complete their work because of spending time revising their papers. However, these data might suggest an alternative explanation. Since both groups were provided

with the same laboratory report style manual, both groups had access to the same information for minimizing incorrect responses. Both groups showed a high percentage of rejections in Exp. 1; and a subsequent decrease in the percent of rejection in subsequent papers. The differences, therefore, might be explained by the differences in contingencies. For Group II, reference to the laboratory report style manual would minimize incorrect responses and subsequent rejections, and thus increase the probability of completing the course (reaching criteria). For Group I, no such contingencies prevailed, so that reference to the laboratory report style manual had no consequence in determining the S's grade. The decrease in rejections for Group I might be explained by editorial corrections rather than by the instructions and examples provided in the laboratory report style manual; and since there were no consequences in terms of grades for minimizing errors and completing the papers before the end of the semester, the necessity to refer to the manual and carefully attend to the material contained was precluded. Although this study did not obtain data to support this conclusion, further research will be directed at determining the frequency with which Ss refer to the manual under different grading contingencies.

Referring to Figure 1, 4 Ss in Group II performed an optional experiment as compared to only one S in Group I. Since grades were not contingent on Ss performing these experiments, what would account for Ss doing this work? One possibility is the opportunity to perform a study which was of interest to the student. A student completing all 4 experiments was permitted (but not required) to apply the principles of behavior learned in the course to a behavioral problem which interested him or her. Therefore, the consequences for doing this

work was defined in terms of the personal rewards derived from this exercise. For example, two female students performed experiments to control their weight; two male students arranged their environments to improve their study habits; and another female student performed an additional experiment with her laboratory animal. Even though it is not possible to specify the controlling variables maintaining the Ss' behavior in performing the optional experiment, it would appear that requiring completing all 4 experiments did provide at least some of the students with the necessary incentive to do additional research employing the knowledge, techniques, and skills acquired in the course. Of those Ss having completed the 4 experiments, 25% of the Ss in Groups 2 performed an optional experiment as compared to 10% for Group 1.

Since Ss were permitted to work at their own pace, a comparison of Groups 1 and 2 showed that 2 Ss in Group 2 finished the 4 required experiments in the 9th week of a 16 week semester. Of those Ss which finished the course work in Group 1, one S finished the 4 experiments during the next to the last week.

The design of the course also provided the instructors and assistants with feedback on their own behavior. Because the course criteria were specified and supplied to the students, the instructor and assistants were <u>not</u> evaluating the students' performance but rather were assisting the student in reaching criteria. Thus, the instructor was able to teach without his interactions with the student biasing (positively or negatively) his evaluation of the student at the end of the semester.

CONCLUSIONS

The data obtained in this study indicate that where criteria for acceptable work are specified and students are afforded an opportunity to revise or

correct their work, a greater percentage of students will complete course work where grades are made contingent on having completed this work than when grades are not contingent on having completed course work. Although this conclusion may not provide any additional information for the classroom teacher, other aspects of the study may. For instance, in designing the course the instructors selected an event which was rewarding and shared by all students; i.e., grades. The learning situation was arranged so that the student was provided with information concerning the criteria used for determining the acceptability of his work, and when the work did not reach criteria the student was given an opportunity to revise his work until it met criteria. Under these conditions the grade (or reward) was not determined by his rank in the class but rather against a set of criteria which could be met. This design precluded the necessity for using an A, B, C, D, E, F marking system since the student either reached criteria (A) or he did not which was not considered as having failed the course but rather as his having not reached criteria (I). The "I" was removed when the student completed the course work.

It cannot and should not be concluded that grades are ubiquitous in maintaining student behavior. Grades maintain behavior to the extent that they lead to or make available other rewarding events such as honors, scholarships, degrees and acceptance into professional fields, occupational promotions, etc. In order for grades to maintain behavior, it is necessary for grades to lead to other rewarding consequences. But what about the question of all students receiving a grade of "A"? How can we tell the "good" students from the "poor" ones? Both questions are related to the basic assumptions upon which our educational system is based, and would require more time and space

than are available. However, consider this question: If it is possible to arrange contingencies in the class room so that every student can reach criteria, can we continue to justify an educational system which is attempting to discriminate rather than educate?

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REFERENCES

Brain, G. B. Promotion Policies and Student Evaluation. Indiana University School Bulletin, 43, 1967, 19-24.

Goldsmith, N. W. Testing and Grading: An Essential and Integral Part of the Educational Process. In Education, 55, 1967, 26-31.

Link, Harris, and Harris. To Grade or Not to Grade. P.T.A. Magazine, 62, 1967, 10-12.

Malott, R. W., Whaley, D. L. Elementary Psychology Course. Western Michigan University, Kalamazoo, Michigan, 1968.

Mannello, G. College Teaching without Grades. Journal of Higher Education, 35, 1964, 328-34.

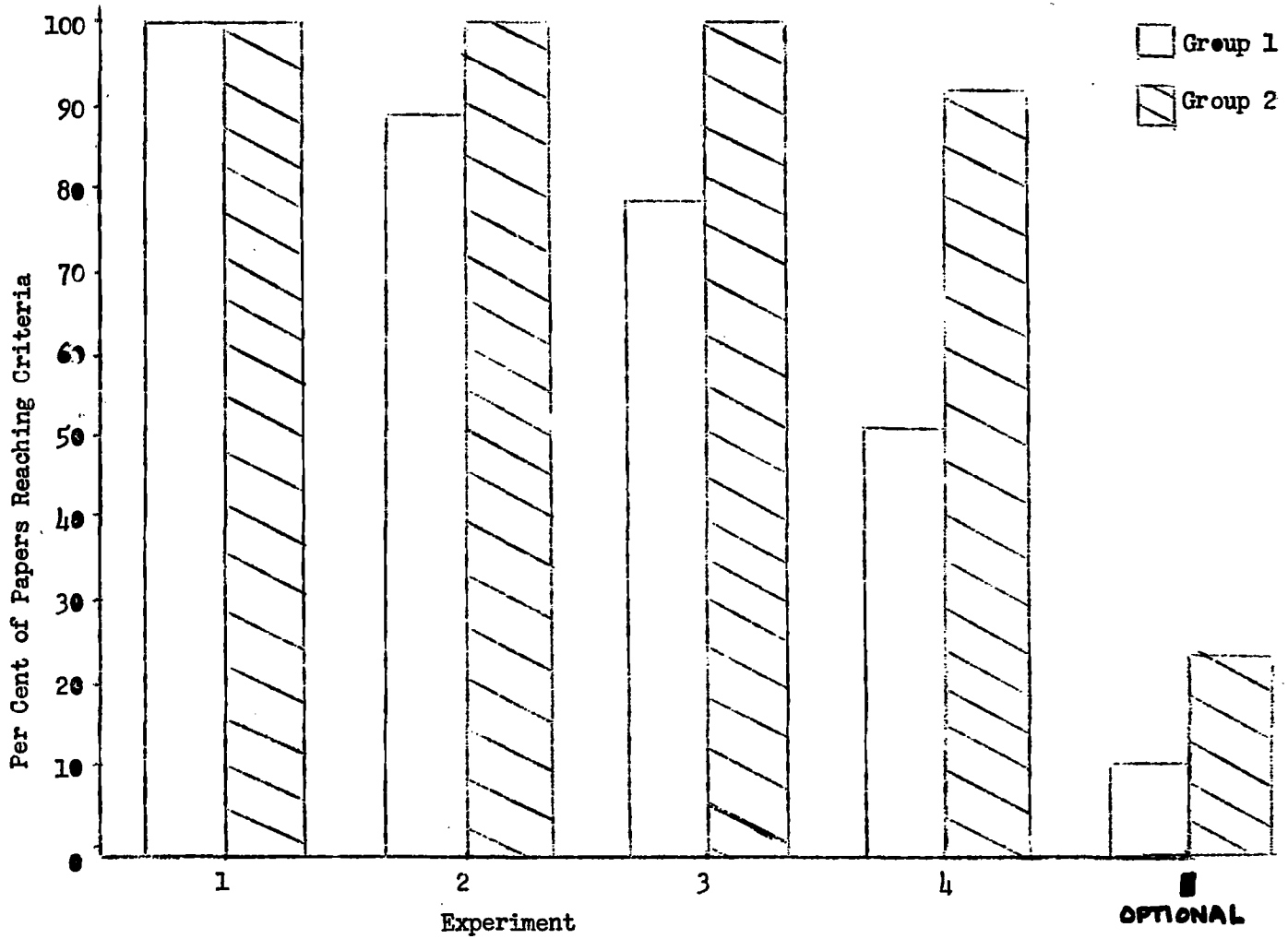

Figure 1 Percentage of student papers reaching criteria for each experiment in a situation in which grades were contingent (Group 2) or non-contingent (Group 1) upon Papers' reaching criteria.

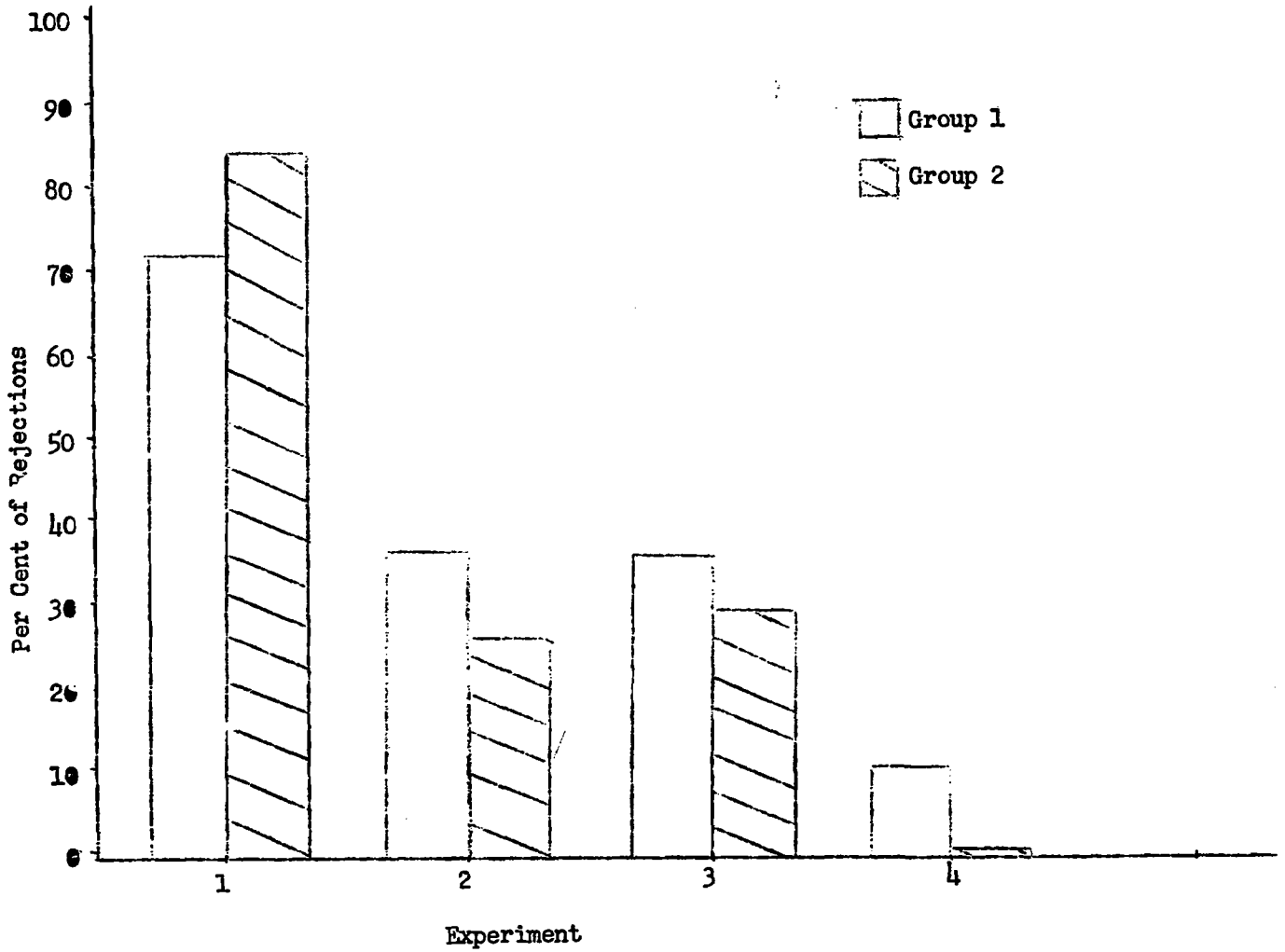

Figure 2 Percentage of paper rejections with contingent (Group 2) vs. non-contingent (Group 1) Grading.